CLAIMS

What is claimed:

1	1. An insulation system comprising:		
2	a first honeycomb panel having a honeycomb core encased in an evacuated		
3	container of insulating material; and		
4	a second honeycomb panel having a honeycomb core encased in an evacuated		
5	container of insulating material, wherein the first and second panel are placed in an		
6	offset arrangement.		
1	2. The insulation system of claim 1 further comprising additional		
2	honeycomb panels each having a honeycomb core encased in an evacuated container		
3	of insulating material, wherein the additional panels are placed in an offset		
4	arrangement.		
1	3. The insulation system of claim 1 wherein the cells of honeycomb have		
2	a hexagonal shape.		

1	4.	A structural member having a combination of substantial stiffness and			
2	a high therma	l resistance, the structural member comprising:			
3	two or	more honeycomb cores adapted for stacking in an offset arrangement			
4	and having pa	rameters selected to provide a desired stiffness; and			
5	one or	more layers of thermal insulation materials selected to provide a desired			
6	thermal resistance, the thermal insulation materials surrounding each of the				
7	honeycomb cores forming a sealed container that is evacuated to provide vacuum				
8	containment of the honeycomb cores.				
1	5.	The structural member of claim 4 wherein the honeycomb core has a			
2	hexagonal sha	pe.			
1	6.	The structural member of claim 5 wherein the offset arrangement is			
2	provided by a horizontal shift.				
1	7.	The structural member of claim 5 wherein the offset arrangement is			
2	provided by a	vertical shift.			
1	8.	The structural member of claim 4 wherein the offset is provided by			
2	utilizing hone	ycomb cores of different geometrical shapes.			
1	9.	The structural member of claim 4 wherein the honeycomb core			

material is comprised of a material having low conductivity.

2

1	10.	The structural member of claim 4 wherein the honeycomb core		
2	material is com	prised of a material having high conductivity and high strength		
3	parameters.			
1	11.	The structural member of claim 4 wherein the honeycomb core cell		
2	walls are comprised of aluminum.			
1	12.	The structural member of claim 11 wherein the thermal insulation		
2	material is aluminized mylar.			
1	13.	A structural system having a high thermal resistance comprising:		
2	a plurali	ity of honeycomb cores, wherein each of the honeycomb cores has cells		
3	with the same g	geometric shape and further wherein each of the honeycomb cores has		
4	the same thickness;			
5	vacuum	containers for separately enclosing each of the honeycomb cores,		
6	wherein the honeycomb cores are placed in the containers and the containers are			
7	evacuated; and			
8	a means	for securing an offset stacked arrangement of the vacuum contained		
9	honeycomb cor	es.		
		•		
1	14.	The structural system of claim 13 wherein each of the cores has the		
2	same thickness.			
1	15.	The structural system of claim 13 wherein the core material has low		
2	conductivity.			

1	16. The structural system of claim 13 wherein the vacuum containers have		
2	multiple layers of radiation blocking material.		
1	17. The structural system of claim 13 wherein the cell geometrical shape is		
2	selected to minimize the contact area between adjacent cell walls of the stack of		
3	enclosed honeycomb cores.		
1	18. The structural system of claim 13 wherein the vacuum containers are		
2	comprised of multilayers of thermal material.		
1	19. A method of providing an insulation system comprising:		
2	providing a first and second honeycomb core;		
3	encasing each of the cores in an evacuated container of insulation material		
4	thereby providing a first honeycomb panel and a second honeycomb panel; and		
5	placing the panels in an offset arrangement.		
1	20. The method of claim 19 further comprising placing additional		
2	honeycomb panels in an offset arrangement with the first and second panels.		
1	21. An insulation system comprising:		
2	a first honeycomb core; and		
3	a second honeycomb core, wherein the first honeycomb core and the second		
1	honeycomb core are stacked in an offset arrangement.		

- 1 22. The insulation system of claim 21 wherein at least one of the honeycomb
- 2 cores is wrapped with insulation material.
- 1 23. The insulation system of claim 21 wherein at least one of the honeycomb
- 2 cores is enclosed in an evacuated container.